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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/605,599

10/11/2003

Peter A. Hogenson

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64722 7590 12/19/2006  
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EXAMINER

COLLINS, TIMOTHY D

ART UNIT

PAPER NUMBER

3643

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

12/19/2006

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

# Office Action Summary

Application No.

10/605,599

Applicant(s)

HOGENSON ET AL.

Examiner

Timothy D. Collins

Art Unit

3643

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 17 October 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments filed 10/17/06 have been fully considered but they are not persuasive.

Examiner disagrees with regard to applicant's argument that part 27 of Schmidt is not a solid film. As stated, part 27 is a pad formed from an elastomeric material and is therefore made of a solid material as opposed to a gas or liquid. Also the limitation that the film is directly bonded to the outer surface, is taken to be a surface of the foam and therefore it is clearly seen as a surface of the foam in the figure 2. Further it is seen in the figure 2 that the part 27 can be taken as a film because of the relation of the thin part 27 on the ceramic blocks 25.

With regard to the argument that Schmidt does not teach a semi-rigid thermal protection system, the applicant's attention is drawn to applicant's specification page 16 that states "Thermal protection systems are well known in the art and are known to come in a variety of configurations and materials. TPS such as ceramic tiles utilized on the space shuttle are only one example" which would lead one to conclude that "semi-rigid TPS" includes the commonly used ceramic tiles as used and understood in the art. Furthermore, the ceramic tile system taught by Schmidt is not a single ceramic sheet covering the tank, but rather a series of rigid ceramic plates which aren't bonded to each other in a rigid plate but are laid against each other (see figure 5), which allows the ceramic plates as a whole to form a "semi-rigid thermal protection system" which is then bonded.

With regard to applicant's argument that Middleton teaches a foam layer as an adhesive and not an insulator. The applicant maintains that the use of the foam in the prior art as an adhesive does not preclude its use as an insulator because it has the same structure. The applicant appears to be arguing more specifically than the claim requires and also is arguing intended use which is not limiting and must be merely capable of performing such a function even if it were stated in the claim in such a functional way.

With regard to applicant's piecemeal analysis against the 103 rejection that Middleton doesn't teach the use of polyurethane foam, the examiner reads the term "foam" broadly and is not limited by insulating qualities which aren't mentioned in the claim, therefore the entire assembly consists of the polyurethane adhesive layer taught by Middleton, the foam assembly of Schmidt, and any additional gases trapped in the application of one to the other.

Furthermore, while not made a formal rejection, Schmidt does teach the use of a foam layer and it would have been obvious to one having ordinary skill in the art to select from known materials (polyurethane or polyimide foams), based on its suitability for the intended use. Therefore, because Middleton teaches the use of polyurethanes in a cryogenic environment it would suggest that it doesn't fail in the extreme temperatures caused by such, and would therefore be a suitable material to choose from when selecting a foam assembly for Schmidt.

With regard to applicant's arguments directed to the honeycomb core, the examiner disagrees with applicant's assertion that Middleton is not suitable to the task.

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The limitations that the honeycomb core not be cellular or have open cells is not mentioned in the claims and is therefore not limiting in a patentable sense.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1 and 11 disclose that the film provides "improved bond strength", which is unclear and relative. It is not known to what this refers or is compared to. The examiner suggests that some frame of reference be placed in the claims if this is to be maintained in the claims. Clarification is needed.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Schmidt (US 5560569).

Schmidt teaches an aircraft thermal protection system which can be bonded to a cryogenic fuel tank wall (col. 3, line 13). Said assembly comprising: a foam assembly

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(29), a solid film bonded the outer surface of foam assembly (27) directly; and a semi-rigid thermal protection system bonded to said foam assembly (25). See column 3, paragraphs 1-6 for a complete description of the materials used in said assembly. Also it is noted that the phrase in the claim of "improved bond strength" is not specific and is relative, therefore it is not known with respect to what does it have improved bond strength. Because of this it is taken as having "a" bond strength, which may be 0 or some "high" other bond strength.

With respect to claim 2, said foam assembly is a polyimide foam layer (col. 4, line 3).

With respect to claim 6, a silicon layer is used to bond assembly together (col. 4, line 9).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

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under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 3-5, 7-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmidt as applied to claims 1 and 2 above, and further in view of Middleton (US 3365897).

With respect to claims 3, 4, 7 and 17 Schmidt teaches the invention as described above with respect to claims 1 and 2, but doesn't teach a polyurethane foam layer. Middleton and Schmidt are in the same field of endeavor, being cryogenic insulation for tanks and space vehicles. Middleton teaches use of a polyurethane layer (31, 37). The motivation for combining Middleton and Schmidt can be found in Schmidt, which is to create a thermal protection system which provides a moisture barrier over a large range of temperatures while providing a uniform outer surface to minimize drag at hypersonic speeds (col. 1, lines 27-37). Therefore, it would have been obvious to one skilled in the art at the time of invention to include a polyurethane layer of Middleton as part of the foam assembly taught by Schmidt to create a more effective cryogenic assembly.

With respect to claim 5, 11 and 18, Schmidt teaches the invention as described above with respect to claims 1 and 2, but doesn't teach a honeycomb core positioned within the foam assembly. Middleton teaches use of a honeycomb core (23). The motivation for combining Middleton and Schmidt can be found in Schmidt, which is to create a thermal protection system which provides a moisture barrier over a large range



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of temperatures while providing a uniform outer surface to minimize drag at hypersonic speeds (col. 1, lines 27-37). Therefore, it would have been obvious to one skilled in the art at the time of invention to include a honeycomb layer of Middleton as part of the assembly taught by Schmidt to create a more effective cryogenic assembly.

With respect to claims 8, 13, 15, and 21, Schmidt teaches the invention as described above with respect to claims 1 and 2, but doesn't teach a second solid film layer bonded to inner surface of foam layer. Middleton teaches use of a film layer bonded to inner surface of foam layer (29). The motivation for combining Middleton and Schmidt can be found in Schmidt, which is to create a thermal protection system which provides a moisture barrier over a large range of temperatures while providing a uniform outer surface to minimize drag at hypersonic speeds (col. 1, lines 27-37). Therefore, it would have been obvious to one skilled in the art at the time of invention to include a solid film layer bonded to the inner surface of the foam layer of Middleton as part of the assembly taught by Schmidt to create a more effective cryogenic assembly.

With respect to claims 9, 10, 12, 14 and 15, Schmidt teaches the invention as described above with respect to claims 1 and 2, but doesn't teach a fabric layer bonded to solid film layer. Middleton teaches use of an impact resistant fabric layer (39). Therefore, it would have been obvious to one skilled in the art at the time of invention to include the impact resistant fabric layer of Middleton as part of the assembly taught by Schmidt to create a more effective cryogenic assembly.

With respect to claim 16, said foam layer is a polyimide foam layer (col. 4, line 3).



With respect to claim 19, a silicon layer is used to bond assembly together (col. 4, line 9).

With respect to claims 20 and 22, Schmidt teaches the invention as described above with respect to claims 1 and 2, but doesn't teach a second fabric layer bonded to the inside of foam layer. Middleton teaches use a film layer bonded to the inner (29) and outer surfaces (33). Therefore, it would have been obvious to one skilled in the art at the time of invention to include the impact resistant fabric layer of Middleton as part of the assembly taught by Schmidt to create a more effective cryogenic assembly.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

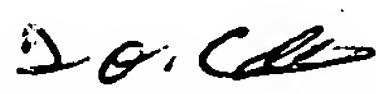
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy D. Collins whose telephone number is 571-272-6886. The examiner can normally be reached on M-F, 7:00-3:00, with every other Fri. off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter M. Poon can be reached on 571-272-6891. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

 12/13/06  
Timothy D. Collins  
Primary Examiner  
Art Unit 3643